

QAPP AMENDMENT FORM

IRRIGATED LANDS REGULATORY PROGRAM

COALITION NAME: EAST SAN JOAQUIN WATER QUALITY COALITION

WDR ORDER #: R5-2012-0116_R3

QAPP VERSION: 3.0

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TITLE: Request for Modification to Field Quality Control Sample Frequency Requirements

SECTION OF QAPP AFFECTED: This amendment applies to Table 10 (Core site names, site IDs, and number of water samples collected each month, page 33) and Table 15 (Field Sampling QC, page 47).

JUSTIFICATION: Field Quality Control (QC) samples include both field blanks and field duplicates. Field blanks assess contamination that can occur during sample collection while field duplicates assess the variability that can occur while collecting an environmental sample. Currently, the Coalition collects field duplicate and field blank samples at the frequency required in the Irrigated Lands Regulatory Program Quality Assurance Project Plan Guidelines (Attachment C to the Monitoring and Reporting Program).

Attachment C dictates that at a minimum, one full “QC Set”, which includes one field blank and one field duplicate sample, must be included per analytical method batch per sampling event (page 18). Furthermore, field duplicate samples must be collected at a rate of 5% for each analysis or one set per sampling event, whichever is more frequent (page 23). The intent of this added language to the 2008 QAPP Guidelines was to ensure consistency in sampling procedures regardless of who collected the samples for the Central Valley ILRP coalitions. Some coalitions have multiple agencies/consultants collecting their samples and the language was implemented to ensure that adequate QC was being collected and analyzed per event to address variability between sampling crews.

During the 2018 Water Year (October 2017 – September 2018), The East San Joaquin Water Quality Coalition (ESJWQC or Coalition) will implement a revised pesticide monitoring strategy based on the Pesticide Evaluation Protocol (PEP) issued by the Central Valley Regional Water Quality Board (CVRWQB) in November of 2016. In accordance with the PEP, the Coalition has designed a monitoring schedule for the 2018 WY that focuses on monitoring for pesticides when they are likely to be used. The new monitoring strategy represents a significant

departure from the previous pesticide monitoring schedule which included monitoring for the same set of pesticides monthly regardless of use.

Under the previous strategy, the Coalition monitored for a consistent list of constituents at each of the six Core sites in addition to more focused monitoring that occurs at Represented and Management Plan sites. The Coalition was able to collect a single set of QC samples per analytical method from a Core site every event, which resulted in 10-25% of the samples collected being either field blanks or field duplicates (still above the required 5% QC requirement). With the implementation of the PEP, the list of constituents monitored will vary by month and by Core site. In order to meet the requirement of collecting a field duplicate and a field blank for each constituent each event, the Coalition could end up collecting twice as many field QC samples compared to environmental samples.

To illustrate this point, Table 1 includes the relative counts of environmental samples and associated field QC samples for the 2018 WY if the Coalition were to collect a field duplicate and a field blank every sampling event for each constituent. When taken as a percentage of total samples measured per analytical method, the field QC requirements can be as high as 70% of all samples collected by the Coalition (Table 1).

Not only do the field QC requirements increase the logistical efforts for each sampling event, they also represent a significant increase in the analytical costs to the Coalition. If a field blank and field duplicate were collected every event, the total analytical cost for the 2018 WY is projected to be \$483,845; \$181,854 (38%) of this total is field QC analytical costs.

Table 1. Projected sample counts and cost for 2018 WY given current field QC sample requirements

ANALYTICAL METHOD	ANNUAL ENVIRONMENTAL SAMPLE COUNT	ANNUAL FIELD BLANK COUNT	ANNUAL FIELD DUPLICATE COUNT	TOTAL ANNUAL SAMPLE COUNT	PERCENT FIELD QC	TOTAL COST
EPA 8081A	46	27	27	100	54%	\$13,500
EPA 8141A	66	39	39	144	54%	\$25,200
EPA 8151	23	9	9	41	44%	\$6,560
EPA 8290	20	7	7	34	41%	\$20,400
EPA 8321A	49	49	49	147	67%	\$33,075
EPA 821-R-02-012, 013 (<i>C. dubia</i>)	71	0	12	83	14%	\$57,270
EPA 821-R-02-012, 013 (<i>P. promelas</i>)	65	0	12	77	16%	\$53,130
EPA 821-R-02-012, 013 (<i>S. capricornutum</i>)	92	0	12	104	12%	\$61,880
SM 9223	72	12	12	96	25%	\$4,763
EPA 353.2	81	12	12	105	23%	\$3,647
SM 4500NH3 C	76	12	12	100	24%	\$3,473
SM 4500P E	72	12	12	96	25%	\$5,257
EPA 200.8	56	18	18	92	39%	\$2,291
EPA 180.1	66	12	12	87	28%	\$1,994
SM 2340 C	52	15	15	82	37%	\$2,392
SM 2540D	72	12	12	95	25%	\$2,771

ANALYTICAL METHOD	ANNUAL ENVIRONMENTAL SAMPLE COUNT	ANNUAL FIELD BLANK COUNT	ANNUAL FIELD DUPLICATE COUNT	TOTAL ANNUAL SAMPLE COUNT	PERCENT FIELD QC	TOTAL COST
SM 5310B (Total)	72	12	12	96	25%	\$6,002
SM 5310B (Dissolved)	43	10	10	63	32%	\$5,514
ASTM D-422-63, ASTM D4464M-85	16	0	2	18	11%	\$2,363
Walkley Black	16	2	2	20	20%	\$2,625
EPA 600/R-99-064	16	0	2	18	11%	\$29,340
EPA 8270C (EI)	12	9	9	30	60%	\$12,750
EPA 8270M (NCI)	42	49	49	140	70%	\$50,400
EPA 547	12	7	7	26	54%	\$3,900
EPA 549.1	12	6	6	24	50%	\$3,600
EPA 630	18	6	6	30	40%	\$4,500
EPA 633	1	1	1	3	67%	\$450
EPA 8260 mod	14	9	9	32	56%	\$4,800
USGS Mod	56	47	47	150	63%	\$60,000
Total						\$483,845

The purpose of collecting and analyzing field QC samples is to monitor consistency between sampling teams and adherence to sampling protocols as described within the QAPP. MLJ-LLC has been monitoring for this Coalition since before the current WDR implementation (since 2006) and has demonstrated compliance with monitoring Standard Operating Procedures and compliance with Measurement Quality Objectives as outlined in the QAPP. As documented in Section 8 of this QAPP, field samplers must complete rigorous initial training courses, as well as yearly refresher courses. In addition, as outlined in Section 20, comprehensive review of all laboratory data, and an open dialogue with the sampling team regarding any field-related quality concerns, ensure that the samples collected by the sampling crew are representative of the waterbody and without contamination. In the past five years of sample collection, the overall acceptability of both field blank and field duplicate samples has remained well above the minimum annual threshold of 90% (Table 2). All samples collected by MLJ-LLC have been acceptable and any flagged sample has been investigated and explained with the Coalition's Annual Report.

Table 2. Percent acceptability of field QC sampling years 2012 through 2016

Water Year	PERCENT ACCEPTABLE	
	Field Blank Samples	Field Duplicate Samples
2012	99.6%	97.5%
2013	99.8%	95.6%
2014	99.8%	95.5%
2015	99.5%	96.3%
2016	99.8%	97%

Given the additional time and costs associated with collecting a field duplicate and a field blank for each analyte during each event, the Coalition requests to remove the requirement of collecting field QC every sampling event and retain the requirement that field QC will be collected at a minimum of 5% of the annual total of samples.

The total analysis cost for the 2018 WY is projected to be \$330,694 when a minimum of 5% of the samples collected are field QC; \$28,191 (9%) of the total reflects field QC analysis costs (Table 3). This reduces the percent field QC from 38% to 9% of the annual sample costs (cost savings of \$153,663).

The Coalition requests minor changes to the current QAPP (Table 4 and 5) to reflect a minimum of 5% field duplicate and 5% field blank sample collection as an annual requirement. The 5% field QC requirement is sufficient for the Coalition and Regional Board staff to assess field sampling comparability and potential contamination and is comparable to other monitoring program field QC requirements.

Table 3. Proposed field QC frequency for the 2018 WY

ANALYTICAL METHOD	ANNUAL ENVIRONMENTAL SAMPLE COUNT	ANNUAL FIELD BLANK COUNT	ANNUAL FIELD DUPLICATE COUNT	TOTAL ANNUAL SAMPLE COUNT	PERCENT FIELD QC	TOTAL COST
EPA 8081A	46	3	3	52	12%	\$7,020
EPA 8141A	66	4	4	74	11%	\$12,950
EPA 8151	23	2	2	27	15%	\$4,320
EPA 8290	20	2	2	24	17%	\$14,400
EPA 8321A	49	3	3	55	11%	\$12,375
EPA 821-R-02-012, 013 (<i>C. dubia</i>)	71	0	4	75	5%	\$51,750
EPA 821-R-02-012, 013 (<i>P. promelas</i>)	65	0	4	69	6%	\$47,610
EPA 821-R-02-012, 013 (<i>S. capricornutum</i>)	92	0	5	97	5%	\$57,715
SM 9223	72	4	4	80	10%	\$3,969
EPA 353.2	81	5	5	91	11%	\$3,160
SM 4500NH3 C	76	4	4	84	10%	\$ 2,917
SM 4500P E	72	4	4	80	10%	\$ 4,381
EPA 200.8	56	4	4	64	13%	\$ 1,882
EPA 180.1	66	4	4	74	11%	\$ 1,696
SM 2340 C	52	3	3	58	10%	\$ 1,692
SM 2540D	72	4	4	80	10%	\$ 2,334
SM 5310B (Total)	72	4	4	80	10%	\$ 5,002
SM 5310B (Dissolved)	43	3	3	49	12%	\$ 4,288
ASTM D-422-63, ASTM D4464M-85	16	0	1	17	6%	\$ 2,231
Walkley Black	16	1	1	18	11%	\$ 2,363
EPA 600/R-99-064	16	0	1	17	6%	\$ 27,710
EPA 8270C (EI)	12	2	2	16	25%	\$ 6,800
EPA 8270M (NCI)	42	3	3	48	13%	\$ 17,280
EPA 547	12	1	1	14	14%	\$ 2,100
EPA 549.1	12	1	1	14	14%	\$ 2,100
EPA 630	18	1	1	20	10%	\$ 3,000
EPA 633	1	1	1	3	67%	\$ 450
EPA 8260 mod	14	1	1	16	13%	\$ 2,400
USGS Mod	56	3	3	62	10%	\$ 24,800
Total						\$330,694

DETAIL OF CHANGES:

Table 4. (Element 10) Core site names, site IDs, and number of water samples collected each month.

Site Name	Station Code	Latitude	Longitude	Zone	Analytical Parameter	# Samples	Sampling SOP	Sample Volume	Containers
Cottonwood Creek @ Rd 20	545XCCART	36.8686	-120.1818	1	See Table 5	1	Appendix I	28 L (7.4 gallons)	See Table 12
Dry Creek @ Wellsford Rd	535XDCAWR	37.6602	-120.8743	2	See Table 5	1	Appendix I	28 L (7.4 gallons)	See Table 12
Duck Slough @ Gurr Rd	535XDSAGR	37.2142	-120.5596	3	See Table 5	1	Appendix I	28 L (7.4 gallons)	See Table 12
Highline Canal @ Hwy 99	535XHCHNN	37.4153	-120.7557	4	See Table 5	1	Appendix I	28 L (7.4 gallons)	See Table 12
Merced River @ Santa Fe	535XMRSFD	37.4271	-120.6721	5	See Table 5	1	Appendix I	28 L (7.4 gallons)	See Table 12
Prairie Flower Drain @ Crows Landing Rd	535XPFDCL	37.4422	-121.0024	6	See Table 5	1	Appendix I	28 L (7.4 gallons)	See Table 12
Field Duplicate Samples	Random				All parameters	1 per event-5% of total annual project samples	Appendix I	28 L (7.4 gallons)	See Table 12
Field Blank Samples	Random				All parameters except toxicity	1 per event-5% of total annual project samples	Appendix I	8 L (2.1 gallons)	See Table 12
Matrix Spike Samples	Random				Pesticides, nutrients, metals, TOC	1 per event	Appendix I	15.8 L (4.2 gallons)	See Table 12

Table 5. (Element 14) Field Sampling QC.

Sample Type	Frequency	Acceptable Limits	Corrective Action	Sampling SOP	Analytical SOP & Method
Water Column Toxicity					
Field Duplicate	5% annual total, minimum 5% per event	RPD ≤25%	Determine cause, take appropriate corrective action.	Appendix I	Appendix XV; EPA821-R02-12
Organic and Inorganic Chemistry Parameters					
Field Blank	5% annual total	Detectable substance contamination <RL or < sample/5	Determine cause of problem, remove sources of contamination.	Appendix I	See Table 16
Field Duplicate	5% annual total	RPD ≤25%	Determine cause, take appropriate corrective action.		
Sediment Toxicity					
Field Duplicate	5% annual total, minimum 5% per event	RPD ≤25%	Determine cause, take appropriate corrective action.	Appendix I	Appendix XVIII, EPA 600/R-99-064
Sediment Chemistry					
Field Blank	5% annual total	Detectable substance contamination <MDL	Determine cause of problem, remove sources of contamination.	Appendix I	Appendix XXXII; GCMS-NCI-SIM
Field Duplicate	5% annual total	RPD ≤25%	Determine cause, take appropriate corrective action.		
Sediment TOC					
Field Duplicate	5% annual total	RSD ≤20%	Determine cause, take appropriate corrective action.	Appendix I	Appendix XXXIV; Walkley Black Method
Sediment Grain Size					
Field Duplicate	5% annual total	RSD ≤20%	Determine cause, take appropriate corrective action.	Appendix I	Appendix XXXIII; ASTM D422-63